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ZOOLOGY.—*Notes on Chinese spiders chiefly of the family Argiopidae*.¹ IRVING FOX, Department of Zoology and Entomology, Iowa State College, Ames, Iowa. (Communicated by C. F. W. MUESEBECK.)

In the following pages is continued a report on Chinese spiders loaned through the courtesy of the authorities of the United States National Museum. This material, unless otherwise indicated, was collected by Dr. D. C. Graham in Szechwan Province during the years 1923 to 1930, and is deposited in the United States National Museum.

Family ARGIOPIDAE

Argiope amoena L. Koch

Argiope amoena L. Koch, Verh. Zool.-Bot. Ges. Wien. 27: 735, Pl. XV, Fig. 1. 1877.

Records.—China: Szechwan Province, Gongshien, August 1-4, 1934, female; near Shiao Shiang Lin Pass, 6500 ft., July 22, 1928, female; Queichou, Shih Men Kan, July 1, 1934, 3 females. Soochow, female (N. Gist Gee, collector). Himan Province, September 15, 1920, female (J. R. Thompson, collector).

Argiope bruennichi (Scopoli)²

Aranea bruennichi Scopoli, Obs. Zool. in Ann. V. Hist.-Nat., p. 125, 1772.

Records.—China: Szechwan Province, Suifu, near Yunnan Border, 2000 ft., October 10, 1924, female; Tseo Jia Geo, 2000 ft., August 30, 1929, female.

Argiope ocula, n. sp.

Fig. 6

Female.—Total length, 23 mm. Carapace, 7.6 mm long, 6.8 mm at the widest place, 2.88 mm wide in front. Carapace light brown above with distinct dark lines radiating from the transverse thoracic groove. Clypeus and chelicerae dark brown, much darker than the dorsum of the carapace. Sternum dark brown, with a large median light lanceolate design, labium and endites dark brown, with yellowish distal borders, coxae dark brown,

¹ Received May 12, 1938.

² For synonymy see Reimoser's catalogue in Abh. Zoo. Bot. Ges. Wien, 10: 42. 1919.

each with an irregular median yellow patch. Legs reddish brown, somewhat darker distally. Dorsum of the abdomen with a grayish brown ground color, the anterior end with two light yellowish transverse bands; at a place about one-third the length of the abdomen from the anterior end are two yellowish spots with black shadows posteriorly. A short median dark line below these spots sends out two branches on each side. The general design of the dorsum bears a rather close likeness to Bösenberg and Strand's figure of the species described by them as *Aranea ikomonsanus*.³ Sides of the abdomen irregular gray and brown; venter dark brown, enclosed by a light longitudinal band on each side.

Anterior row of eyes recurved, slightly narrower than the procurved posterior row. Anterior median eyes two-thirds as large as the anterior lateral, separated from each other by slightly more than a diameter. Posterior lateral eyes seven-eighths as large as the posterior median, contiguous with the anterior lateral eyes. Posterior median eyes separated from each other by less than a diameter, from the anterior median by slightly more than a diameter. Median ocular quadrangle wider than long (23/18), slightly wider in front than behind. Clypeus equal in height to about one-half the diameter of an anterior median eye. Upper cheliceral margin armed with four teeth of which the third from the claw is the largest, lower cheliceral margin armed with three teeth increasing in size, the third from the claw being the largest. Tibia and patella IV, 10 mm long, tibia and patella I lacking. For the structure of the epigynum see Fig. 6.

Type locality.—China: Female holotype from Shin-Kai-Si, Mt. Omei, Szechwan Province, 4000 ft., August 7, 1929 in the United States Museum (U.S.N.M. Cat. No. 1299).

This new species may be readily distinguished from the other Chinese members of its genus by the coloration and design of the abdomen. In this respect and in the structure of the epigynum, it does not seem to be closely related to any described Chinese species.

***Gasteracantha kuhlii* C. L. Koch**

Gasteracantha kuhlii C. L. Koch, Arachn. 4: 20, Fig. 262. 1838.

Gasteracantha leucomelas Bösenberg and Strand, Abh. Senckenb. Naturf.

Ges. 30: 239, Pl. 3, Fig. 18, Pl. 15, Fig. 395. 1906.

Gasteracantha nabona Chamberlin, Proc. United States Nat. Mus. 63: 22, 1924 (New Synonym.)⁴

Records.—This species is represented in the United States National Museum by Chamberlin's female holotype from Soochow, China (N. Gist Gee), and by two females from Kiang Su, China (M. McDade). A single female from Mupin, Szechwan Province, 4500 ft., July 24, 1929 (D. C. Graham) is in the American Museum of Natural History.

***Meta doenitzi* Bösenberg and Strand**

Meta doenitzi Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30:180, Pl. 11, Figs. 238, 239. 1906.

Record.—China: Szechwan Province, Suifu, two females.

³ Bösenberg, W. and Strand, E. Abh. Senckenb. Naturf. Ges., 30: 234, Pl. 11, Fig. 224. 1906.

⁴ For further synonymy see Dahl in Mitteil. Zoo. Mus. Berlin 7: 262, 1914.

Meta kompirensis Bösenberg and Strand

Meta kompirensis Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30: 181, Pl. 3, Fig. 6, Pl. 11, Fig. 242. 1906.

Record.—China: Szechwan Province between Suifu and Yachow, 1000 ft., June 5, 1929, female.

Cyclosa argenteo-alba Bösenberg and Strand

Cyclose argenteo-alba Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30: 202, Pl. 4, Fig. 38, Pl. 15, Fig. 419. 1906.

Record.—China: Szechwan Province, Suifu, female.

Cyclosa atrata Bösenberg and Strand

Cyclosa atrata Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30: 204, Pl. 4, Fig. 28, Pl. 15, Fig. 417. 1906.

Record.—China: Szechwan Province, Suifu, October, 1930, female.

Cyclosa monticola Bösenberg and Strand

Cyclosa monticola Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30: 210, Pl. 15, Fig. 413. 1906.

Record.—China: Szechwan Province, Suifu, 1000 ft., April 25, 1930, female.

Eucta caudicula (Karsch)

Eugnatha caudicula Karsch, Verh. Ver. Rheinfl. 36: 66, Pl. i, Fig. 4. 1879.

Tetragnatha (Eucta) caudicula Bösenberg and Strand, Abh. Senckenb. Natuf. Ges. 30: 179, Pl. 15, Fig. 408. 1906.

Record.—China: Szechwan Province, South of Suifu, 1000 ft., March 25, 1930, female; Suifu, October, 1930, three females.

Tetragnatha japonica Bösenberg and Strand

Tetragnatha japonica Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30: 177, Pl. 15, Fig. 409. 1906.

Records.—China: Szechwan Province, Tseo-Jia-Geo, 2000 ft., August 30, 1929, male and female; Chengtu, 1700 ft., August 5, 1933, female; Chungking, 2000 ft., May 6, 1930, male; between Suifu and Kiating, June 26, 1930, male and female.

Tetragnatha recurva Schenkel

Tetragnatha recurva Schenkel, Arkiv. för Zoologi 29: 85, Fig. 29. 1936.

Record.—China: Szechwan, Suifu, 1000 ft., April 25, 1930, two males, two females.

Leucauge blanda (L. Koch)

Meta blanda L. Koch, Verh. Zool.-Bot. Ges. Wien. 27: 743, Pl. 15, Fig. 5. 1877.

Leucauge blanda Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30: 182, Pl. 3, Fig. 8, Pl. 15, Fig. 394. 1906.

Records.—China: Szechwan, Mupin, 4500 ft., July 24, 1929, twelve females; between Chengtu and Kuan Shien, July, 1924, two females; Shin-Kai-Shi, July 6, 1924, 4000 ft., seven females; Chungking, 2000 ft., May 6, 1930, female.

Poecilopachys bufo Bösenberg and Strand

Poecilopachys bufo Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30: 241, Pl. 3, Fig. 12, Pl. 11, Fig. 219. 1906.

Record.—China: Szechwan Province, Ningyuen Fu, 6200 ft., July 31, 1928.

***Aranea scylla* (Karsch)**

Epeira scylla Karsch, Verh. Ver. Rheinl. 36: 71. 1879.

Aranea scylla Bösenberg and Strand, abh. Senckenb. Naturf. Ges., 30: 215, Pl. 11, Figs. 202, 220. 1906.

Records.—China: Szechwan, Suifu, 1000 ft., June, 1925, five females, one male; Chungking, 2000 ft., May 6, 1930, three females; Shin-Kai-Shi, 4500 ft., July 6, 1934, two females.

***Aranea pentagrammica* (Karsch)**

Miranda pentagrammica Karsch, Verh. Ver. Rheinl. 36: 72, Pl. i, Fig. 6. 1879.

Aranea pentagrammica Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30: 219, Pl. 4, Fig. 35, Pl. 11, Fig. 211. 1906.

Record.—China: Szechwan, Suifu, April, 1925, female.

***Aranea sia* Strand**

Aranea (*Zilla*) *sia* Strand, Abh. Senckenb. Naturf. Ges. 30: 237, Pl. 4, Fig. 24. 1906.

Record.—China: Szechwan Province, 2000 ft., June, 1923, two males, two females.

***Aranea ventricosa* (L. Koch)**

Epeira ventricosa L. Koch, Verh. Zool.-Bot. Ges. Wien. 27: 739, Pl. 15, Fig. 2. 1877.

Aranea ventricosa Bösenberg and Strand, Abh. Senckenb. Naturf. Ges. 30: 213, Pl. 3, Fig. 15, Pl. 11, Figs. 198, 199, Text fig. 3. 1906.

Records.—China: Szechwan, Yoa Gi, 7400 ft., July 3, 1929, 2 females; Tseo Jia Geo, 2000 ft., Aug. 30, 1929, female; Suifu, 1000 ft., October 20, 1925, female; Ningyuen Fu, 6200 ft., July 31, 1928, female; near Yunnan Border, 3500 ft., May 1, 1928, two females; Gongshien, August 1, 1934, male; Lu Ding Chiao, 5000 ft., August 8, 1923, female; Tatsientu, July 20, 1923, female. Soochow, female (N. Gist Gee, collector). Himan Province, September 15, 1920, two females (L. R. Thompson, collector).

***Aranea boesenbergi*, n. sp.**

Fig. 7

Female.—Total length, 7.5 mm. Carapace, 1.44 mm long, 1.35 mm at the widest place, .9 mm wide in front. Carapace brown above without distinct dark markings, somewhat darker at the sides. Chelicerae lighter than the carapace. Sternum dark brown contrasting strongly with the lighter coxae. Labium and endites dark brown with lighter distal borders. Legs irregular dark and light brown without distinct annulations. Dorsum of the abdomen with a broad transverse brown band at the base; posterior to this is a triangular white patch within which a median dark line gives off branches on each side. (Among the paratypes are specimens in which this design is partially or wholly lacking.) Sides of the abdomen and venter grayish brown, the latter outlined by an irregular white stripe on each side.

Anterior and posterior rows of eyes recurved, the former narrower than the latter. Eyes of the anterior row subequal, somewhat closer to each other than to the anterior lateral, removed from the posterior median eyes by about one diameter. Eyes of the posterior row subequal, the posterior median closer to each other than to the posterior lateral. The lateral eyes of

each row contiguous. Median ocular quadrangle wider than long (15/11), as wide in front as behind. Clypeus slightly higher than the diameter of an anterior median eye. Lower cheliceral margin armed with three subequal teeth, upper cheliceral margin armed with four teeth of which the first and third, counting from the claw, are largest. Tibia and patella I, 1.76 mm; metatarsus and tarsus I, 1.6 mm long. Tibia and patella IV, 1.44 mm; metatarsus and tarsus IV, 1.36 mm long. Epigynum wider than long, with a broad scape flanked on each side by a circular atrium. For further details of the structure of the epigynum see Fig. 7.

Type locality.—China: Female holotype and seven female paratypes from Mupin, Szechwan Province, 3500 ft., July, 1927 in the United States National Museum (U.S.N.M. Cat. No. 1300).

The epigynum of this species resembles that of *A. pentagrammica* (Karsch) in general structure. It differs, however, in that the scape is shorter and broader. This new species also differs in the design of the abdomen and in being much smaller.

Aranea triangula, n. sp.

Figs. 4 and 5

Female.—Total length, 21 mm. Carapace, 10.5 mm long, 7.4 mm at the widest place, 4.4 mm wide in front. Carapace and chelicerae reddish brown without distinct dark markings. Sternum and coxae dark brown, the latter lighter medially. Labium and endites dark brown with pale distal borders. Legs reddish brown, darker at the distal ends of the joints. Abdomen more or less triangular in shape, basally with a pair of prominent humps followed by two more humps on each side; narrowing posteriorly and bifurcate at the termination. The distinct design consists of a dark median triangular portion outlined irregularly by whitish bands. Sides of the abdomen and venter grayish brown.

Anterior and posterior rows of eyes slightly recurved, the former narrower than the latter. Anterior median eyes much larger than the anterior lateral (11/7), much closer to each other than to the anterior lateral, removed from each other by about a diameter, from the posterior median eyes by slightly less than a diameter. Posterior median eyes smaller than the anterior median, about as large as the posterior lateral eyes, much closer to each other than to the latter, separated from each other by slightly more than a diameter. Lateral eyes of both rows subequal situated very close together beneath a heavily sclerotized prominence on each side. Median ocular quadrangle much wider than long (25/15), wider in front than behind (25/20). The median eyes situated on a horny prominence. Clypeus equal in height to one and one-half times the diameter of an anterior median eye. Lower cheliceral margin armed with three subequal teeth, upper margin armed with four teeth of which the third from the claw is the largest. Tibia and patella I equaling tibia and patella IV in length (9.76 mm), metatarsus and tarsus I equaling metatarsus and tarsus II in length (8 mm). Epigynum relatively small, wider than long (excluding the scape) with a subtriangular scape more sclerotized medially than at the sides. For further details regarding the structure of the epigynum see Fig. 4.

Type locality.—China: Female holotype from Ningyuen Fu, Szechwan Province, July 31, 1928, in the United States National Museum (U.S.N.M. Cat. No. 1301).

This new species does not seem to be closely allied to any described mem-

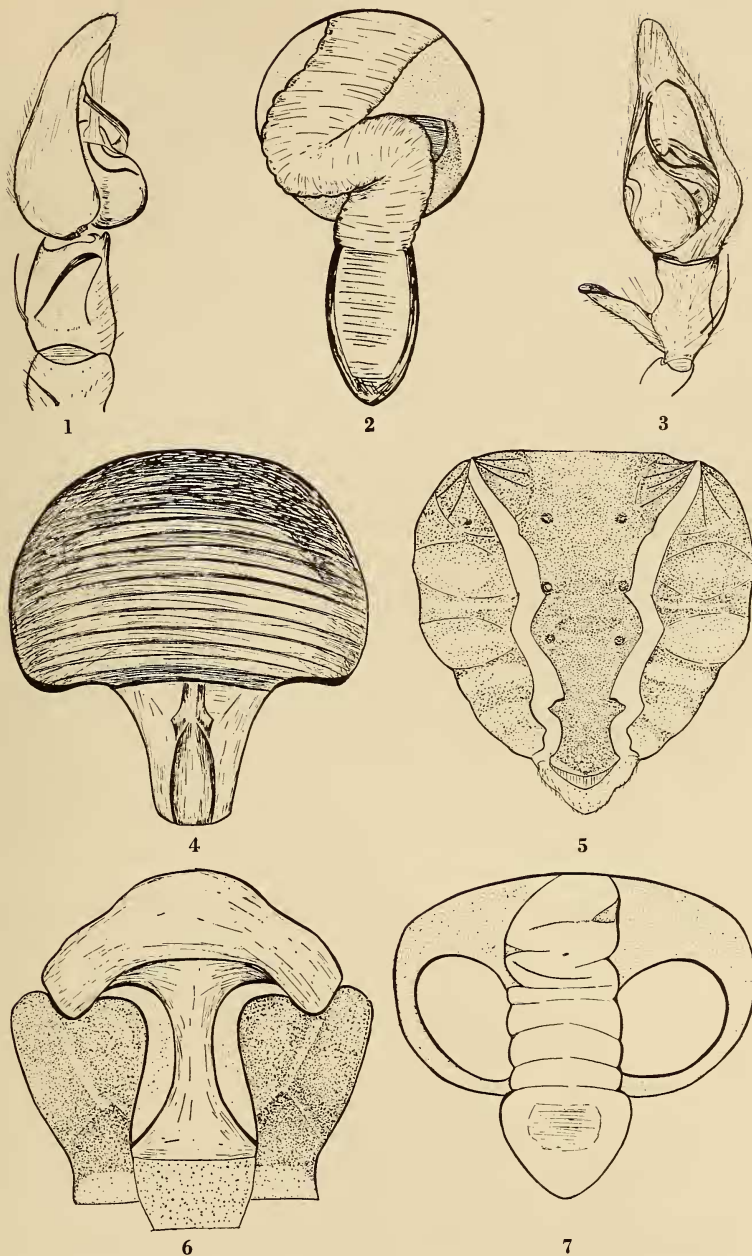


Fig. 1.—*Heteropoda exigua*, n. sp., male, right palpus, lateral view. Fig. 2.—*Aranea virga*, n. sp., epigynum. Fig. 3.—*Heteropoda exigua*, n. sp., male, right palpus, ventral view. Fig. 4.—*Aranea triangula*, n. sp., epigynum. Fig. 5.—*A. triangula*, n. sp., female, dorsal view of abdomen. Fig. 6.—*Argiope ocula*, n. sp., epigynum. Fig. 7.—*Aranea boesenbergi*, n. sp., epigynum.

ber of its genus. It may be readily recognized by the design on the dorsum of the abdomen (Fig. 5) and by the epigynum.

Aranea virga, n. sp.

Fig. 2

Female.—Total length, 12.5 mm. Carapace, 5.6 mm long, 4.4 mm at the widest place, 2.08 mm wide in front. Carapace reddish brown above with irregular dark brown spots and a large dark brown triangular mark which encloses the thoracic groove and extends anteriorly in the form of two dark longitudinal lines. Sternum and coxae dark brown without lighter markings; labium and endites concolorous with the sternum except for the distal edges which are light yellow. Chelicerae and clypeus dark, contrasting strongly with the pars cephalica. Femora and patellae of the legs dark brown, lighter basally; tibiae light yellow with dark annulations at the proximal and distal ends of the joint; metatarsi yellow with a dark distal annulation; tarsi dark brown with a basal yellow annulation. Dorsum of the abdomen with evidences of a pair of shoulder humps and a distinct dark brown folium within which is a broken median white band. The dark folium is outlined with dirty white. Sides and venter black.

Anterior and posterior rows of eyes slightly recurved, the former somewhat narrower than the latter. Anterior median eyes slightly larger than the anterior lateral, much closer to each other than to the latter, removed from each other by one and one-half times a diameter, from the posterior median eyes by about a diameter. Posterior median eyes about two-thirds as large as the anterior median, separated from each other by less than a diameter, much further from the posterior lateral eyes and somewhat larger than the latter. Lateral eyes close together, situated beneath a sclerotized prominence on each side. Median ocular quadrangle wider than long (17/10), wider in front than behind (17/13). Clypeus equal in height to about one and one-half times the diameter of an anterior median eye. Lower cheliceral margin armed with three teeth, upper margin armed with four teeth of which the first and third from the claw are the largest. Tibia and patella I, 7.6 mm long, metatarsi and tarsi I, 6.8 mm; tibia and patella IV, 5.68 mm; metatarsi and tarsi IV, 5.2 mm. For details regarding the structure of the epigynum see Fig. 2.

Type locality.—China: Female holotype from Mupin, Szechwan Province, July, 1929, in the United States National Museum (U.S.N.M. Cat. No. 1302).

This new species may be easily distinguished from the other Chinese members of its genus by the structure of the epigynum whose scape is rather long and basally convoluted.

Family SPARASSIDAE⁵

Heteropoda exigua, n. sp.

Figs. 1 and 3

Male.—Total length, 8 mm. Carapace, 3.6 mm long, 3.44 mm at the widest place, 1.84 mm wide in front. Dorsum of the carapace reddish brown with darker streaks radiating from the dorsal groove; sides and clypeus lighter. Sternum and coxae light yellow, labium and endites somewhat

⁵ I wish to express my appreciation to Dr. B. J. Kaston who has pointed out that the name Sparassidae was not first proposed by Simon in 1874 but by Bertkau in 1872 (Arch. F. Nat. 38: 232), hence it has priority over Heteropodidae Thorell 1873, which I had regarded as the earliest family denomination (Jour. Washington Acad. Sci. 27: 461. 1937).

darker. Legs concolorous with the dorsum of the carapace, with dark punctations. Abdomen reddish brown above lighter at the base than at the distal end. Venter clear yellow proximally, with reddish spots distally.

Anterior and posterior rows of eyes slightly recurved, the former less than three-fourths as wide as the latter. Anterior median eyes about one-half as large as the anterior lateral, closer to each other than to the latter, removed from each other by about one diameter. Posterior median eyes about three-fourths as large as the posterior lateral, closer to each other than to the latter, removed from each other by about one diameter, from the latter by about one and one-half diameters. Lateral eyes of each row situated on chitinized protuberances. Median ocular quadrangle slightly longer than wide (20/19), narrower in front than behind (12/19). Clypeus equal in height to one and one-half times the diameter of an anterior median eye. Chelicerae with four teeth on the lower margin and three teeth on the upper of which the middle one is the largest. Anterior tibiae with 2-2-2-2 spines below, anterior metatarsi with 2-2 spines below. Posterior tibiae with 2-2-2 spines below, posterior metatarsi with 2-2 spines below. Patella and tibia I, 6 mm long, patella and tibia IV, 5.6 mm. The palpus of this species resembles that of *H. hamata* I. Fox in the tibial process which is simple, unbranched, and lacks an associated shorter process. It differs, however, in that the process is not curved, and in other details illustrated in Figs. 1 and 2.

Type locality.—China: Yunnan Border, South of Suifu, Szechwan Province, China, 6000 ft., October, 1928, in the United States National Museum (U.S.N.M. Cat. No. 1303).

This new species finds a place in the group whose members bear a close resemblance in general appearance to *H. venatoria* (Linn.). It is somewhat smaller than the other species, but is nevertheless characteristic in coloration. It may be specifically separated from the other Chinese species of the genus by the palpal organ.

Family UROCTEIDAE

Uroctea compactilis L. Koch

Uroctea compactilis L. Koch, Verh. Zool. Bot. Ges. Wien, 27: 749, Pl. 15, Fig. 11. 1877.

Records.—China: Szechwan, Suifu, April 23, 1935, three females; June, 1925, 1000 ft., two females, male.

Family OXYOPIDAE

Oxyopes sertatus L. Koch

Oxyopes sertatus L. Koch, Verh. Ver. Zool.-Bot. Ges. Wien, 27: 779. 1877.

Records.—China: Szechwan Province, between Suifu and Kiating, June 26, 1930, eight females, three males; Suifu, September 1929, female; Chungking, 2000 ft., May 6, 1930, three females.

ORNITHOLOGY.—*A new subspecies of the European nuthatch from North Siam.*¹ H. G. DEIGNAN. (Communicated by HERBERT FRIEDMANN.)

The race of *Sitta europæa* resident upon the higher mountains of

¹ Received June 27, 1938.